***Julia*: Hello and welcome to a DerivSource podcast.**

I'm Julia Schieffer, the founder and editor of DerivSource.com

As the XVA valuation framework continues to evolve, today's derivatives practitioners are facing complicated, computational challenges as they work to achieve their end goal, which is of course profitability.

In this DerivSource podcast we speak to Satyam Kancharla, chief strategy officer and senior vice president at Numerix about this new risk management model for pricing adjustments. We talk about this model in some detail, its role in derivatives risk management space and of course some of the challenges that market practitioners face as they utilise XVA. We'll also discuss very briefly some trends impacting other pricing models such as MVA and KVA.

***Julia*: Welcome to the podcast, Satyam.**

Satyam: Hi Julia, good to be here.

***Julia*: Satyam, could you provide a brief overview of XVA pricing adjustments and how it plays a role in derivatives risk management?**

Satyam: Sure. So the XVA pricing adjustments have to do with changing the price, or adjusting the price, of a derivative to take various externalities (or things that were considered externalities in the past) into account, and primarily there are three major factors I would say, 3 C's, that contribute to the XVA.

One is counterparty risk, and this was the first one that became popular with CVA and DVA coming into the picture.

The second is collateral, so whether it's FVA or MVA or even the different CVAs, collateral is an important factor.

The third C is capital, so different derivatives structures incur different or varying levels of capital cost. These are also costs that are naturally part of the business of trading and hedging derivatives. And therefore in the past while many of these hidden costs were considered too small to be material and less important in the management of derivatives on a day-to-day basis, since the crisis many of these adjustments have been shown to be very significant, given the current regulatory climate, given the CSAs or Credit Support Annexes that are in place now, given the need for collateral, given the need for central clearing. These have all been shown to be very significant, and therefore these XVAs or pricing adjustments are now the standard components, let's say, of any derivatives business, whether it's on the sell side or on the buy side.

***Julia*: What are the new pricing constraints institutions are now working under. What do they need to do in order to be successful?**

Satyam: If we look at pricing as a discipline, post-crisis and post the recent changes in market structure and regulatory structures that are in place right now, it is important to have an overall mid-level price as well as all these adjustments.

It's also important to calculate many of these adjustments and the prices on a pre-trade basis because often you may be more profitable trading a certain structure, let's say with a different counterparty or with a central clearing structure as opposed to bilateral, and making trading decisions purely based on the price or the spread is no longer sufficient or no longer optimal. And as a result you need to do all these adjustments and all these adjustments on a pre-trade basis, on a real-time basis, and more often than not you're expected to do this for a range of scenarios and also compute all the hedges associated with various adjustments and the whole base price as well.

So what that means is scalability in terms of compute. There is also the need to have all this information calculated on an accurate basis because this is all information that can be

used for hedging and making trading decisions, as opposed to purely reporting. And it also has to be timely, which means market data has to be refreshed and updated on a regular basis or a real-time basis.

So, all of these things really change the way pricing is architected. Really increase the compute needs as well, as well as data requirements.

So it's a different ball game really, I would say that various institutions are working under, both on the sell side as well as the buy side.

Julia: **Satyam, what are the latest XVA models and infrastructure trends and techniques? It seems that MVA, or Margin Valuation Adjustment, has been particularly in vogue recently, why is this?**

Satyam: As we discussed earlier, XVA started out with CVA and then DVA, and then funding entered the picture. Since then, we've seen the introduction of capital as well as margin as important adjustments that are significant, and material for anyone trading derivatives or transacting derivatives from the buy side or hedging derivatives.

In particular, margin valuation adjustment comes round due to margin, and margin is something we need to post on, whether the trade is centrally cleared or is bilaterally cleared, there are Basel regulations that require margin to be posted for bilateral trading as well, and the focus from the regulatory perspective has been to bring some level of parity between bilateral trading as well as central clearing in terms of margin.

There are significant minimum amounts that are required to be posted on the bilateral side, and this is something that is being implemented now as we speak. There are different deadlines associated with different types of banks; the bigger banks go live first, and so on and so forth. There are also dates that are different in Europe and North America, but a whole range of institutions, banks in particular, are putting margin calculations and MVA calculations in place as we speak in order to deal with bilateral margin and in order to incorporate the cost of bilateral margin into the price.

Since this is an important material impact on the price, this number is then obviously passed on to the buy-side customers as well, and this is where pricing this accurately can mean the difference between keeping a customer, or [vetting] a customer rather, or not.

Therefore, both margin calculations, margin projections as well as margin valuation adjustments, have been really important and have been the part of discussions recently and are being implemented at this time.

***Julia*:** **Let's move on to KVA, or Capital Valuations Adjustments, what trends do you see impacting that particular pricing model?**

Satyam: Sure. So every one of the derivatives transactions, whether it's centrally cleared or bilateral, has a capital impact for the bank, and capital obviously comes around due to market risk, due to CVA capital as a less counterparty credit risk, and buy-side and sell-side institutions are looking to optimise how they trade since different types of trade attract different types of capital, or different levels of capital.

For example, centrally cleared trades might have a lower capital cost relative to bilateral trades. On the other hand, bilateral trades may have an advantage with respect to collateral posted, will have an advantage with respect to basis risk obviously, because you have a more tailored derivative that fits the needs of the institutions.

So, in order to look at these different options in the same footing, put it all on the same basis, KVA is an important adjustment. And what's interesting about KVA is that capital is not a one-time charge - this is a charge that has to be borne by the bank throughout the life cycle of the trade. So if the trade is a 20-year trade there are capital costs related to this trade that go out all the way to 20 years in the future.

Therefore, in order to compute KVA what you require is the ability to calculate capital and project that out over time and over many different scenarios and simulations into the future. It's not unlike what people do, let's say for VaR on the market risk side, except now you're looking at a much longer horizon; instead of looking at 10 days you're looking at many years. You're also looking at a lot more simulations, you're looking at things at the netting set level, at a banking book level at the entire trade book level.

So the volumes are large, the calculations go out into the future for a long time, the number of simulations are large, and therefore calculating KVA really involves taking some educated optimisations, estimations, one can use standardised methods for calculating capital, as well as more advanced or internal models as well for capital.

What's most important though is to make sure that the information that is needed by the trading desk or by the risk managers is available on a timely basis. And it's important to allow the decision makers to have a sense of capital efficiency, of Strategy A versus Strategy B. So it's not really important to have a very accurate capital projection; it's more important to allow people to make the right decisions, and make the most capital efficient decisions.

This is again something that is being implemented at this time - it's of interest. In many cases, KVA can be larger than CVA or other adjustments, so KVA is definitely a major initiative that is going on in many banks now.

***Julia*: Finally, Satyam, how widely adopted are XVA profitability frameworks today?**

Satyam: In my experience, with the frameworks and overall calculations around profitability, there's obviously a range of implementations that exist. In general, what you will see is the larger the bank the bigger the derivatives exposure. In the business, the more sophisticated they are in terms of calculating XVA and looking at it from an overall holistic profitability perspective.

Many of the Tier two banks and the smaller institutions have also started implementing it, but I would say in many cases on a partial basis, based on the specific risks that they know are significant or material for them.

So it is likely for a certain bank, they care more about CVA rather than, let's say FVA, or MVA, because the particular situation they're in, they expect that the overall numbers at the book level are more material for let's say CVA, rather than FVA or MVA, in which case they would only implement CVA and not implement all these other adjustments.

Many institutions are taking it one step at a time, as opposed to going for the full range of XVAs all at once, going step-by-step. In other cases, there are banks and even buy-side institutions that are going for the entire range of XVAs at once because it's really important to put it all together and look at the total EVA, or total valuation adjustment, that comes around due to all these different adjustments being combined.

There is a range, obviously there are geographical differences as well. In Europe and North America we see more adoption; in Asia there are certain pockets where this is being adopted, but the market is certainly not at the same point where Europe is or North America is.

The adoption really varies by size of institution, by geography, and also (in the case of buy-side institutions) some of the larger buy-side institutions are definitely taking this very seriously, they're almost as sophisticated as sell-side institutions in having a sense of all these XVAs and using all this information to their advantage when they negotiate CSAs, when they negotiate new derivatives transactions.

***Julia:* Thank you Satyam Kancharla for offering his expertise on XVA models.**

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